AMENDMENTS TO THE SPECIFICATION

Please replace the paragraph beginning at page **17, line 2**, and insert the following rewritten paragraph:

Next, a method of estimating a joint moment of a biped walking mobile body in accordance with the present invention is a method of estimating a moment acting on at least one joint of each leg of a biped walking mobile body by using an estimated value of the position of a floor reaction force acting point successively determined by the floor reaction force acting point estimating method according to the present invention described above. And this joint moment estimating method includes a step for successively estimating the floor reaction force of each leg in contact with the ground of the biped walking mobile body by using at least a detection output of an acceleration sensor attached to a body of the biped walking mobile body to detect the acceleration of a predetermined part of the body of the biped walking mobile body and a detection output of a body inclination sensor attached to the body to detect an inclination angle of the body, and a step for successively grasping the inclination angle of each rigid corresponding part of a biped walking mobile body that corresponds to each rigid body of a rigid link model representing the biped walking mobile body in the form of a link assembly of a plurality of rigid bodies, the acceleration of the center of gravity of the rigid corresponding part, and the angular acceleration of the rigid corresponding part by using at least a detection output of the body inclination sensor and a detection output of an angle sensor attached to a joint to detect the bending angle of the joint

of each leg of the biped walking mobile body, wherein the moment acting on at least one joint of each leg of the biped walking mobile body is estimated on the basis of an inverse dynamics model by using an estimated value of the floor reaction force, an estimated value of the position of the floor reaction force acting point, an inclination angle of the aforesaid each rigid corresponding part, an acceleration of the center of gravity of the rigid corresponding part and an angular acceleration of the rigid corresponding part, predetermined weight and size of each rigid corresponding part, a predetermined position of the center of gravity of each rigid corresponding part in the rigid corresponding part, and a predetermined inertial moment of each rigid corresponding part.

Please replace the paragraph beginning at **page 23, line 7**, and insert the following rewritten paragraph:

Fig. 1 (a) and Fig. 1 (b) are diagrams for explaining a basic principle of a method of estimating floor reaction forces in an embodiment of the present invention, Fig. 2 is a diagram schematically showing a human being as a bipedal walking mobile body and a construction of an apparatus installed on the human being in an embodiment of the present invention, Fig. 3 is a block diagram for explaining the functions of an arithmetic processing unit installed in the apparatus shown in Fig. 2, and Fig. 4 is a diagram showing a rigid link model used for processing performed by the arithmetic processing unit shown in Fig. 3. Fig. 5 is a diagram for explaining a technique for calculating the position (horizontal position) of a metatarsophalangeal joint in a first embodiment of the present invention and a

technique for grasping the distance from an ankle joint to a ground contact surface, Fig. 6 (a) to (c) are diagrams for explaining a technique for estimating the horizontal positions of a floor reaction force acting point in a level-ground walking mode, and Fig. 7 is a diagram for explaining the processing in a joint moment estimating means of the arithmetic processing unit of Fig. 3. Fig. 8 and Fig. 9 are graphs illustrating the time-dependent changes in the horizontal position and the vertical position, respectively, of the floor reaction force acting point in the level-ground walking mode determined according to the first embodiment of the present invention, Fig. 10 and Fig. 11 are graphs illustrating the time-dependent changes in a knee joint moment and a hip joint moment, respectively, in the level-ground walking mode determined according to the first embodiment of the present invention, Fig. 12 and Fig. 13 are graphs illustrating the time-dependent changes in a knee joint moment and a hip joint moment, respectively, in a staircase descent walking mode determined according to the first embodiment of the present invention, Fig. 14 and Fig. 15 are graphs illustrating the time-dependent changes in a knee joint moment and a hip joint moment, respectively, in a staircase ascent walking mode determined according to the first embodiment of the present invention, Fig. 16 and Fig. 17 are graphs illustrating the time-dependent changes in a knee joint moment and a hip joint moment, respectively, in a ~~sitting-onto-a-chair~~raising-from-chair mode determined according to the first embodiment of the present invention, and Fig. 18 and Fig. 19 are graphs illustrating the time-dependent changes in a knee joint moment and a hip joint moment, respectively, in a sitting-onto-a-chair mode determined according to the first embodiment of the present invention. Fig. 20 is a diagram for explaining a technique for calculating the position of a

metatarsophalangeal joint in a second embodiment of the present invention and a technique for grasping the distance from an ankle joint to a ground contact surface.

Please replace the paragraph beginning at **page 57, line 27**, and insert the following rewritten paragraph:

Furthermore, the positional vector $^T(x12\text{-}xg, z12\text{-}zg)$ of the ankle joint 12 of each leg 2 with respect to the bodily center of gravity G0, that is, ΔXf, ΔZf, ΔXr and ΔZr in the above Equation (5), is determined from the position (x12, z12) in the bodily coordinate system Cp of the ankle joint 12 and the current value of the data of the position (xg, zg) of the bodily center of gravity G0 in the bodily coordinate system Cp determined by the bodily center of gravity position calculating means 31.

Please replace the paragraph beginning at **page 74, line 2**, and insert the following rewritten paragraph:

Referring to Fig. 7, the moment acting on the ankle joint 12 of the distal portion of the crus 11 is denoted by M_1, the moment acting on the portion of the knee joint 10 of the crus 11 is denoted by M_2, the inertial moment about the center of gravity G2 of the crus 11 is denoted by I_{G2}, and the angular acceleration about the center of gravity G2 of the crus 11 is denoted by α_2. In association with Fig. 4 mentioned above, if the distance between the center of gravity G2 of the crus 11 and the center of the knee joint 10 is denoted by t2, and the distance between the center

of gravity G2 of the crus 11 and the ankle joint 12 is denoted by t2' (=Ld-t2), then the equation of motion related to the rotational motion about the center of gravity G2 of the crus 11 will be Equation (11) shown below:

Please replace the paragraph beginning at **page 82, line 26**, and insert the following rewritten paragraph:

Referring to Fig. 2, according to the present embodiment, in a human being 1, an ankle joint angle sensor 24 that outputs a signal corresponding to a bending angle $\Delta\theta e$ of an ankle joint 12 is attached to the ankle joint 12 of each leg 2, in addition to the devices explained in the first embodiment. As in the knee joint angle sensor 23 or the like, the ankle joint angle sensor 24 is composed of a potentiometer, and secured to the ankle joint 12 through a belt or the like, which is not shown. Further, the ankle joint angle sensor 24 is connected to an arithmetic processing unit 16 through the intermediary of a signal line, which is not shown, to input its outputs to the arithmetic processing unit 16.